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4006-01

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Ms. Teri Shusterman
Shea Homes
10721 Treena Street, Suite 200
San Diego, CA 92131-1039

**Subject: 4S Ranch PA 37 (Tract No. 5229 RPL2 Lot 263) Project
Environmental Noise Assessment** (Log# 95-08-00166)

Dear Ms. Shusterman:

Dudek & Associates, Inc., has evaluated the noise environment for the 4S Ranch PA 37 (Tract No. 5229 RPL2 Lot 263) project located within San Dieguito Planning Area in the County of San Diego. In summary, the proposed project would develop the site with multi-family uses. The site would be exposed to a future year 2020 traffic noise level of approximately 73 dB CNEL or less. However, common recreational outdoor usable space area would be located within the interior portion of the site and exposed to a future traffic noise level of less than 60 dB CNEL. This noise level would comply with the County's exterior noise criteria. Noise levels at outdoor areas primarily adjacent to Rancho Bernardo Road could be mitigated to 60 dB CNEL or less with six-foot to ten-foot high noise barriers.

To comply with the County and State's interior noise standard, some of the units facing Rancho Bernardo Road and 4S Ranch Parkway will require sound-rated windows and sliding glass/French doors with a minimum STC rating ranging from 28 to 33. Also, the dwelling units facing Rancho Bernardo Road, Town Square Parkway and 4S Ranch Parkway will require either mechanical ventilation and/or air-conditioning so that the windows and doors can be closed at the occupants discretion to meet the interior noise standard.

1.0 BACKGROUND

1.1 Project Setting

The project site will be located at the northeast corner of Rancho Bernardo Road and 4S Ranch Parkway in the County of San Diego (*Figures 1 and 2*). The project would develop the

site with multi-family units. This analysis is based on the site plan (Hunsaker & Associates, April 8, 2004) and preliminary architect plans (McKinley Associates, April 8, 2004).

1.2 County Noise Criteria

The County of San Diego typically describes community noise levels in terms of the Community Noise Equivalent Level (CNEL). CNEL is the average A-weighted sound level during a 24-hour day. It is obtained after adding five decibels (dB) to sound levels in the evening hours (7 p.m. to 10 p.m.) and adding ten dB to the sound levels at night (10 p.m. to 7 a.m.). The five and ten dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The A-weighted scale measures noise levels corresponding to the human hearing frequency response. All sound levels discussed in this report are A-weighted. The acoustical terminology used in this report is defined in *Attachment 1*.

The County has established exterior noise guidelines in the noise element of the County's adopted General Plan (County of San Diego 1980). These guidelines identify compatible exterior noise levels for various land use types. The maximum acceptable exterior noise level for new single family development is 60 dB CNEL. This criteria is applied at the outdoor noise sensitive area. In addition, the County requires that interior noise levels not exceed a CNEL of 45 dB.

Applicable to this project, Part 3 of Policy 4b of the County's Noise Element state that:

If the acoustical study shows that noise levels at any noise sensitive area will exceed CNEL equal to 60 decibels, the development should not be approved unless the following findings are made:

- A. Modifications to the development have been or will be made which reduce the exterior noise level below CNEL equal to 60 decibels; or
- B. If with current noise abatement technology it is infeasible to reduce exterior CNEL to 60 decibels, then modifications to the development have been or will be made which reduce interior noise below CNEL equal to 45 decibels. Particular attention shall be given to noise sensitive interior spaces such as bedrooms. And,

- C. If finding "B" above is made, a further finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without modification as described in "A" above.

The County of San Diego has adopted a quantitative noise ordinance to control excessive noise generated in the County. The ordinance limits are in terms of a one-hour average sound level. The allowable noise limits depend upon the County's zoning district. The RV-9 and C-34 zoning define an hourly nighttime sound level limit of 45 dB at the north and west property lines and 50 dB at the south and east property lines. However, if the measured ambient level exceeds the applicable limit noted above, the allowable one-hour average sound level shall be the ambient noise level.

Construction noise is also governed by the County's noise ordinance. This ordinance restricts the allowable hours of construction activities to 7:00 a.m. through 7:00 p.m. The ordinance also restricts the allowable construction activities to Monday through Saturday excluding legal holidays. Further, the noise levels associated with construction activities at residential receptors are not to exceed 75 dB, averaged over an eight-hour period per day.

2.0 FUTURE NOISE IMPACTS

Rancho Bernardo Road and 4S Ranch Parkway would be the primary traffic noise sources in the future adjacent to the project site. Based on traffic volume projections prepared for the 4S Ranch project, the future year 2010 traffic volume is projected to be 11,600 ADT along Rancho Bernardo Road adjacent to the site (County of San Diego 1998). This volume is less than the year 2020 traffic volume forecast prepared by the San Diego Association of Governments (SANDAG 2000). SANDAG forecasts approximately 18,000 ADT adjacent to the site by the year 2020. Thus, SANDAG's year 2020 traffic volume projection was utilized. The ADT along 4S Ranch Parkway is projected to be 4,800 ADT adjacent to the site (BRW 2001).

The future CNEL for the site was calculated using Caltrans' Sound 32 Traffic Noise Prediction Model (Caltrans 1983) with California noise emission factors (Caltrans 1987). The future traffic speed along Rancho Bernardo Road was assumed to be 55 mph. The future traffic speed along 4S Ranch Parkway was assumed to be 30 mph. The future truck mix was assumed to be 2.0 percent medium trucks and 2.0 percent heavy trucks along Rancho

Bernardo Road. The future truck mix along 4S Ranch Parkway was assumed to be 1 percent medium trucks and 1 percent heavy trucks. The truck mix is based on the truck mix percentage previously utilized for the 4S Ranch project (County of San Diego 1998).

The interior CNEL was calculated based on the architect's preliminary building plans and building orientation shown on the site development plan. The interior noise level depends on the exterior noise level, the sound transmission loss characteristics of the building, construction materials, the sound absorption properties of the interior finish materials and the quality of construction. To calculate the interior noise level, it is necessary to determine the frequency spectrum of the exterior noise in one-third octave bands. The calculations take into consideration the exterior noise level, the construction of the exterior facade, the floor plans and orientation of the homes to the roadways. The sound transmission of the various building elements is also evaluated in each of the one-third octave bands. The calculated interior sound pressure level for each of the exposed rooms is converted into an A-weighted sound level to determine the CNEL.

2.1 Exterior Traffic Noise Impact

The future year 2020 traffic noise level would range up to approximately 73 dB CNEL at the site along Rancho Bernardo Road (e.g., Buildings 3 and 10). The common areas between the buildings, as well as porch and patio areas, would exceed 60 dB CNEL. However, the recreational common outdoor usable space areas would be located within the interior portion of the site along the east side of Building 27 as depicted in *Figure 3*. The recreation area would be shielded from the traffic noise by the proposed intervening buildings. The buildings would shield the common outdoor usable space area to a future noise level of less than 60 dB CNEL.

The noise level would range from approximately 60 to 65 dB CNEL at Buildings 11-16 adjacent to 4S Ranch Parkway. The noise level would range from approximately 62 to 65 dB CNEL at Buildings 1, 2, 21-23 adjacent to Town Square Parkway.

2.2 Interior Noise Impact

Interior noise levels were calculated based on a review of the floor plans. The calculations take into consideration the exterior noise level, the construction of the exterior facade, the floor plans and the orientation and distance of the homes from Rancho Bernardo Road and

4S Ranch Parkway. There are three unit floor plans. The Sound Transmission Class (STC) rating assumed for the windows and sliding glass doors is STC 26. Almost any residential dual pane windows and sliding glass doors can achieve these levels of noise reduction. The stucco walls and will have an STC rating of 46.

With the windows open or closed, the interior CNEL at units facing Rancho Bernardo Road would exceed the County's interior noise standard of 45 dB. With the windows open, the noise level would exceed the County's noise criteria at the units adjacent to 4S Ranch Parkway. The interior CNEL in all the remaining buildings are calculated to be 45 dB or less with the windows open due to the proposed building setbacks, orientations and building materials.

2.3 Construction Noise Impact

Construction activities will generally consist of finish grading activities, utility excavation and installation, and fabrication of the buildings. There are no existing noise sensitive receivers in close proximity to the site. The closest residences are located approximately 1,700 feet south of the site across Camino del Norte. No blasting will be required as part of the project because the site is/will be rough-graded as part of other 4S Ranch development under separate permit. Any necessary blasting will occur as part of the rough grading activities. Thus, the project will only be responsible for finish grading. Also, there are no know noise sensitive habitats that would be affected by these temporary construction activities.

The applicant anticipates that up to five delivery trucks per day, with an average of about one delivery truck per day, would be required for the various building materials and supplies (Shea Homes 2004). These truck trips would generate a noise level less than 60 dB CNEL along roads and would result in a less than significant noise impact

2.4 Mechanical Equipment

Mechanical equipment at the site would include Trane Models TTB024C100A and TTB030C100A condensing units. These units have manufacturer sound power ratings of 80 dB and 78 dB, respectively. The units are approximately two-feet high. The condensing units would be located at the porches of Plans 1 and 2, and at the side of the buildings at Plan 3.

At the Plan 1 units the condensing units would be located behind an arched porch alcove. The typical locations of the condensing units is depicted in *Attachment 3*. At Plan 2 units the condensing units would be located behind a minimum 3.5-high wall along the porch. These architectural design features would shield the units from the view of adjacent off-site residences. In addition, the proposed buildings would screen the majority of the condensing units from the adjacent properties. The off-site areas that would be adjacent to buildings 10 and 21 would front the greatest number of units at the closest distances. Thus, these areas represent the worst-case condition. The noise levels adjacent to Buildings 10 and 21 would be approximately 46 and 44, respectively. This assumes that all the condensing units are operating and a nominal 5 dB noise reduction associated with the arched alcove and 3.5-foot high wall at the porches. The noise level would comply with the County's noise ordinance criteria.

The condensing units would not be located directly adjacent to the windows of any on-site neighboring unit. The distance of the closest condenser unit with a direct line-of-sight to a neighboring on-site unit would be approximately 20 feet. At this distance, the noise level would be approximately 59 dB. The noise level would be 39 dB or less inside the dwelling unit assuming a minimum of 20 dB of noise attenuation with the windows closed. This noise level would result in a less than significant noise impact.

Pool and spa mechanical equipment would consist of four pumps ranging in size from a 1-HP to 2-HP (Shea Homes 2004). Three of the pumps have manufacturer sound ratings of 60 dB at five feet. One pump has a sound rating of 47 dB at five feet. All the pool and spa mechanical equipment would be located inside a building located south of the pool (*Attachment 4*). The pool enclosure would consist of a stucco building. A door with two louvers for ventilation would be installed. Each of the louvers would cover two square feet of area. The building would adequately contain this mechanical equipment noise.

2.5 Recreational Noise

Noise at the site would also be generated by people at the pool and spa area. However, this area would be located within the interior of the site, and approximately 250 feet from the closest property to the south and 280 feet from the closest property to the east. Thus, noise associated with people at the pool and spa area would not be significant because of the distance and shielding provided by intervening buildings.

2.6 Combined Noise

Noise would be generated by traffic as previously described in Section 2.1 as well as mechanical equipment noise from the resident's own condensing units described in Section 2.4. The period of time that any person will run an air-conditioning unit is not know. It can be assumed that an individual will operate an air conditioning unit during the hotter portions of the day. Typically, this occurs between the hours of approximately noon and 5:00 p.m. With this assumption, the condensing units would generate a noise level of approximately 65 dB CNEL at the porches of Plans 1 and 2. This would result in an exterior cumulative noise level of up to approximately 70 dB CNEL at the closest Plans 1 and 2 to Rancho Bernardo Road. With mitigation described in Section 3.0, the interior cumulative noise level would be 45 dB CNEL or less. The occupant has the option of turning the unit off to reduce the cumulative noise exposure.

3.0 MITIGATION

3.1 Exterior Noise

To mitigate the noise level to 60 dB CNEL or less at either the common areas or at least one private porch or balcony would require noise barriers. Minimum 10-foot high noise barriers spanned between Buildings 4 and 5, Buildings 6 and 7, as well as Buildings 8 and 9 would reduce the noise level to 60 dB CNEL at the common yard areas between the pairs of residential buildings. Building 3 would require a six to eight-foot high noise barrier and Building 10 would require an eight foot high noise barrier. Building 11 would require a six-foot high barrier at the west side of the porch of the western most Plan 3 unit. The noise barrier heights and locations are depicted in *Figure 4*. The areas mitigated by these features are also depicted in *Figure 4*. With these noise abatement measures, each of these dwelling units would be provided with an adjacent exterior area where the future noise level would be 60 dB CNEL or less. An alternative to the noise barriers wrapped around Buildings 3 and 10 would be to provide 6.5-foot high noise barriers at the Unit 3 private balconies at Buildings 3 and 10. Also, the private porches at Units 1 and 2 of Buildings 3 and 10 would require six-foot high noise barriers.

The noise barriers may be constructed as a wall, berm, or combination of both. The materials used in the construction of the barrier are required to have a minimum surface density of 3.5 pounds per square foot. They may consist of masonry material, acrylic glass, tempered glass or a combination of these materials.

3.2 Interior Noise

To meet the State and County's interior noise standard will require sound-rated windows and sliding glass/French doors with a minimum STC rating ranging from 28 to 33 at some of the rooms facing Rancho Bernardo Road and 4S Ranch Parkway. The minimum STC ratings required for the windows and sliding glass/French doors are shown in *Table 2*. Representative interior noise calculations are depicted in *Attachment 2*.

TABLE 2. MINIMUM STC RATINGS FOR WINDOWS/DOORS

Building	Floor Plan Unit No.	Room	Window(s)/door(s)	STC Rating
3, 10	1	Bedroom 2	All	30
		Living/Dining Room	All	32
		Master Bedroom	All	31
3, 10	2	Den	All	32
		Living Room	All	31
		Dining Room	All	28
		Kitchen	All	28
		Master Bedroom	All	28
		Bedroom 2	All	31
3, 10	3	Bedroom 3	All	32
		Living/Dining Room	All	33
		Kitchen	All	32
		Master Bedroom	All	33
		Bedroom 2	All	33
4 thru 9	2 (Unit on southerly side only)	Den	All	28
		Living Room	All	28
		Dining Room	All	28
		Kitchen	All	28
		Master Bedroom	All	28
		Bedroom 2	All	28
4 thru 9	3	Bedroom 3	All	32
		Living/Dining Room	All	33
		Kitchen	All	32
		Master Bedroom	All	33
		Bedroom 2	All	33
11	3 (Unit on west side Only)	Bedroom 3	All	28
		Living/Dining Room	All	28
		Bedroom 2	All	28

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The windows must be closed in order to achieve the interior noise criteria for several of the units facing Rancho Bernardo Road, Town Square Parkway and 4S Ranch Parkway. The design for the dwelling units in these buildings must include the means by which adequate ventilation can be provided with the windows closed, i.e., mechanical ventilation and/or air-conditioning. Therefore, the dwelling units facing Rancho Bernardo Road, Town Square Parkway and 4S Ranch Parkway will require mechanical ventilation and/or air-conditioning. The units requiring a mechanical ventilation system and/or air conditioning are the units in Buildings 1-16 and 21-23. The mechanical system shall be in conformance with the 1994, or latest edition of the Uniform Building Code.

The mechanical ventilation and/or air-conditioning must not compromise the dwelling unit noise reduction. Therefore, the outside air vents shall not be located adjacent to Rancho Bernardo Road or the outside air vents shall be acoustically baffled as depicted in *Attachment 5*. The acoustical attic vent baffle treatment shall be constructed using minimum ½-inch thick plywood. The portion of the plywood facing the vent opening shall be lined with minimum one-inch thick sound absorbing material such as Owens-Corning Type 703, or equivalent. The baffle shall extend from the top of the vent to approximately four or more inches below the bottom of the attic vent and a minimum of eight-inches beyond either side of the vent.

This concludes our noise assessment. If you have any questions, please do not hesitate to call me.

Very truly yours,

DUDEK & ASSOCIATES, INC.


Mike Komula, Acoustician

MK/alc

Att.: References

Figures 1-5

Attachment 1 - Definitions

Attachment 2 - Representative Noise Calculations

Attachment 3 - Typical Condensing Unit Locations and Related Noise Level Calculations

Attachment 4 - Pool/Spa Pump Equipment Location

Attachment 5 - Attic Vent Baffle Treatment

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REFERENCES

California Department of Transportation (Caltrans), June 1983. *User's Instructions for SOUND32 (FHWA/CA-83/06)*.

California Department of Transportation (Caltrans), 1987. *California Vehicle Noise Emission Levels, (FHWA/CA/TL-87/03)*.

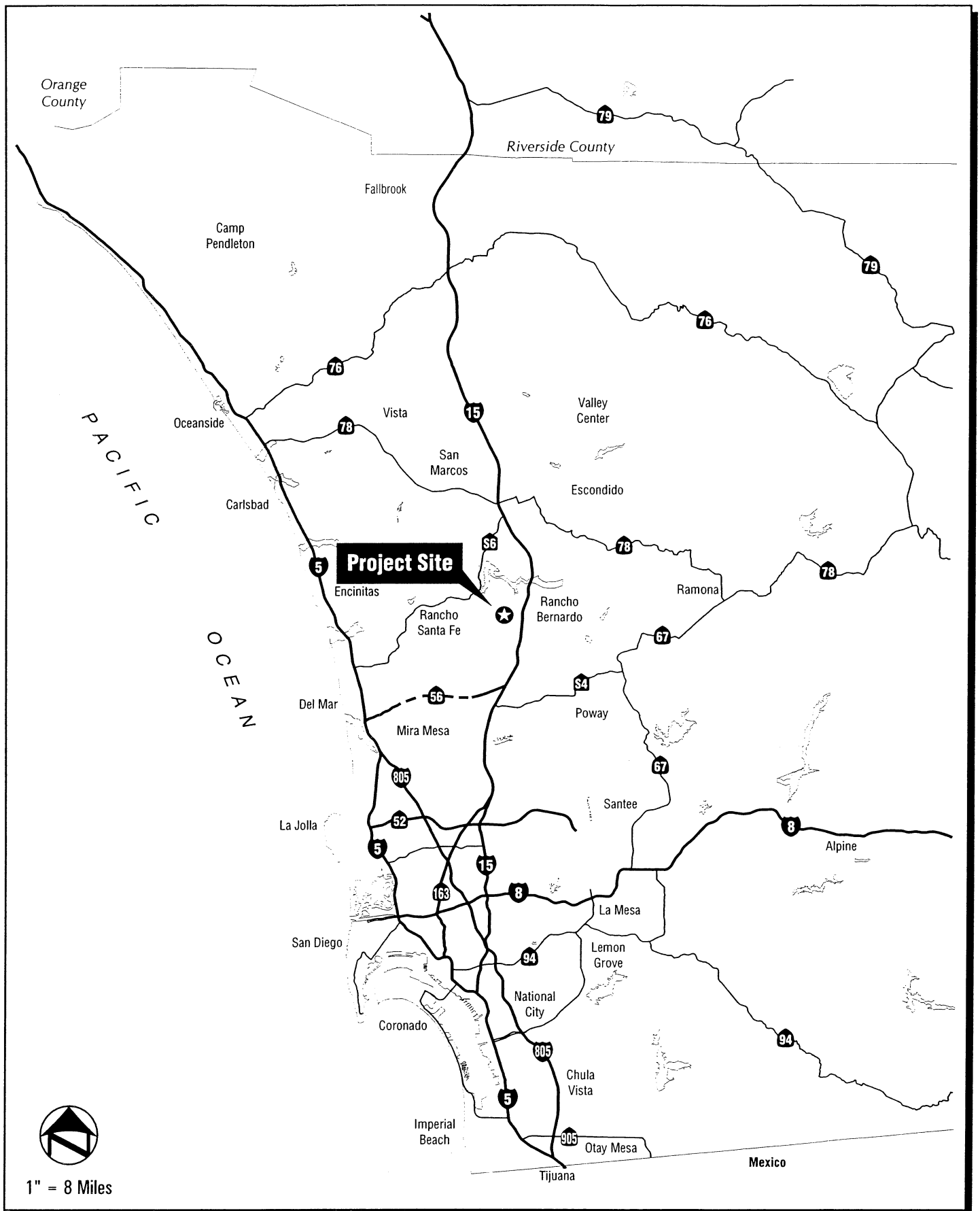
BRW, June 11, 2001. *4S Ranch Transportation Study--Daily Segment Volumes within 4S Ranch Neighborhoods 3 and 4*.

County of San Diego, December 17, 1980. *San Diego County General Plan Noise Element*.

County of San Diego, November 4, 1998. *Final Environmental Impact Report 4S Ranch, San Diego County, California*.

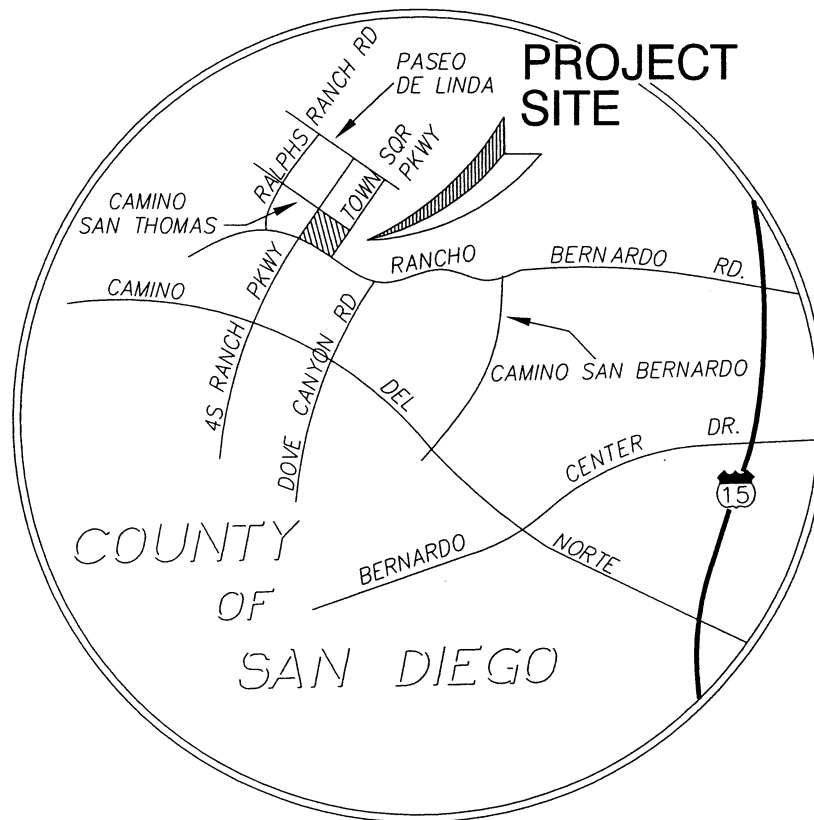
San Diego Association of Governments (SANDAG). November 2000. *San Diego Regional Traffic Forecast Volumes Year 2020*.

Shea Homes, February 4, 2004. *Personal Communication with Ms. Terri Shusterman*.



4S Ranch Planning Area 37 Project - Environmental Noise Assessment
Regional Location

FIGURE
1

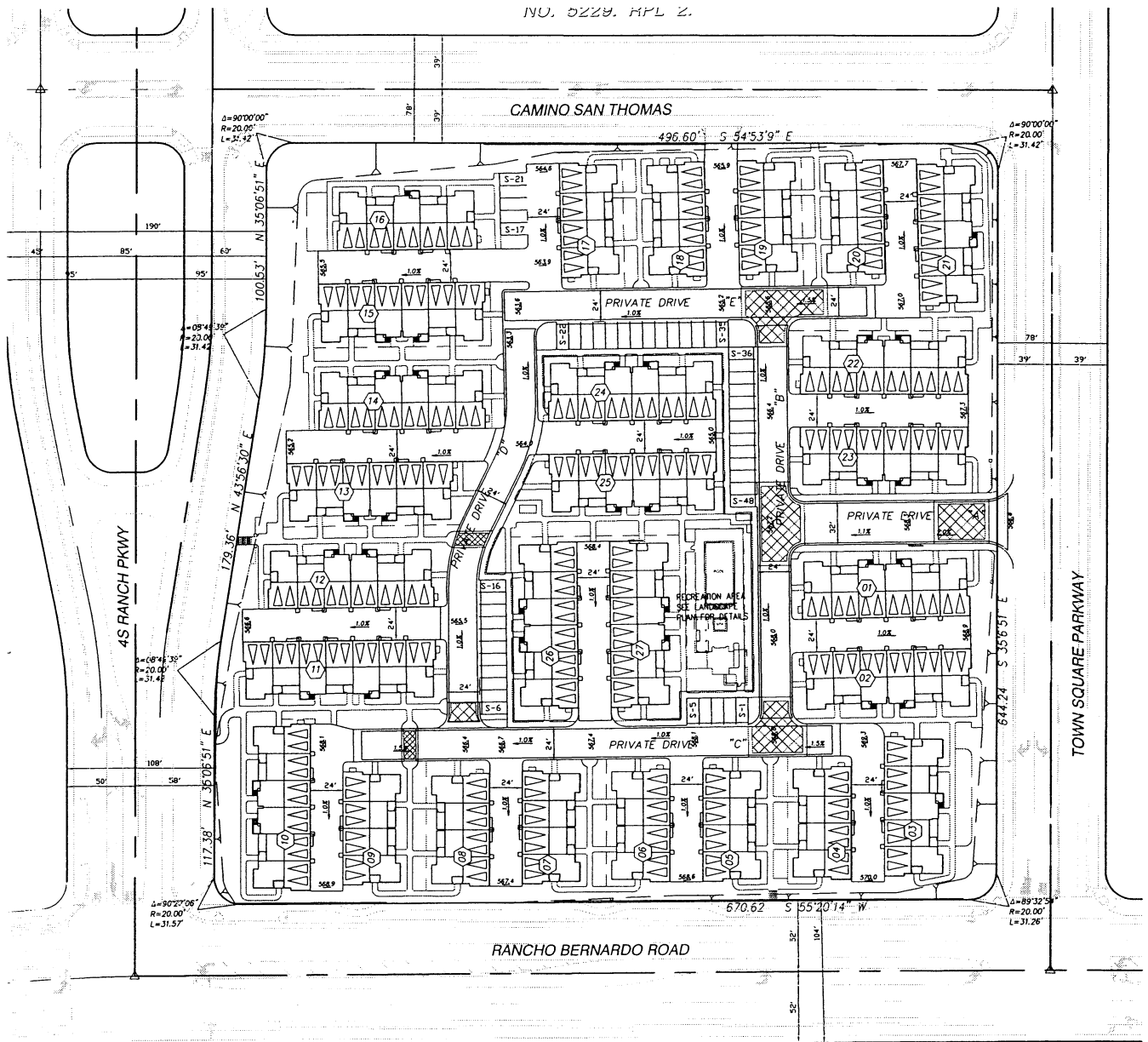


SOURCE: HUNSAKER & ASSOCIATES, FEBRUARY 2004

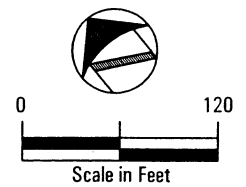
4S Ranch Planning Area 37 Project - Environmental Noise Assessment
Project Location

FIGURE
2

NO. 0228. MPL 2.

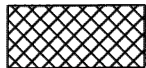
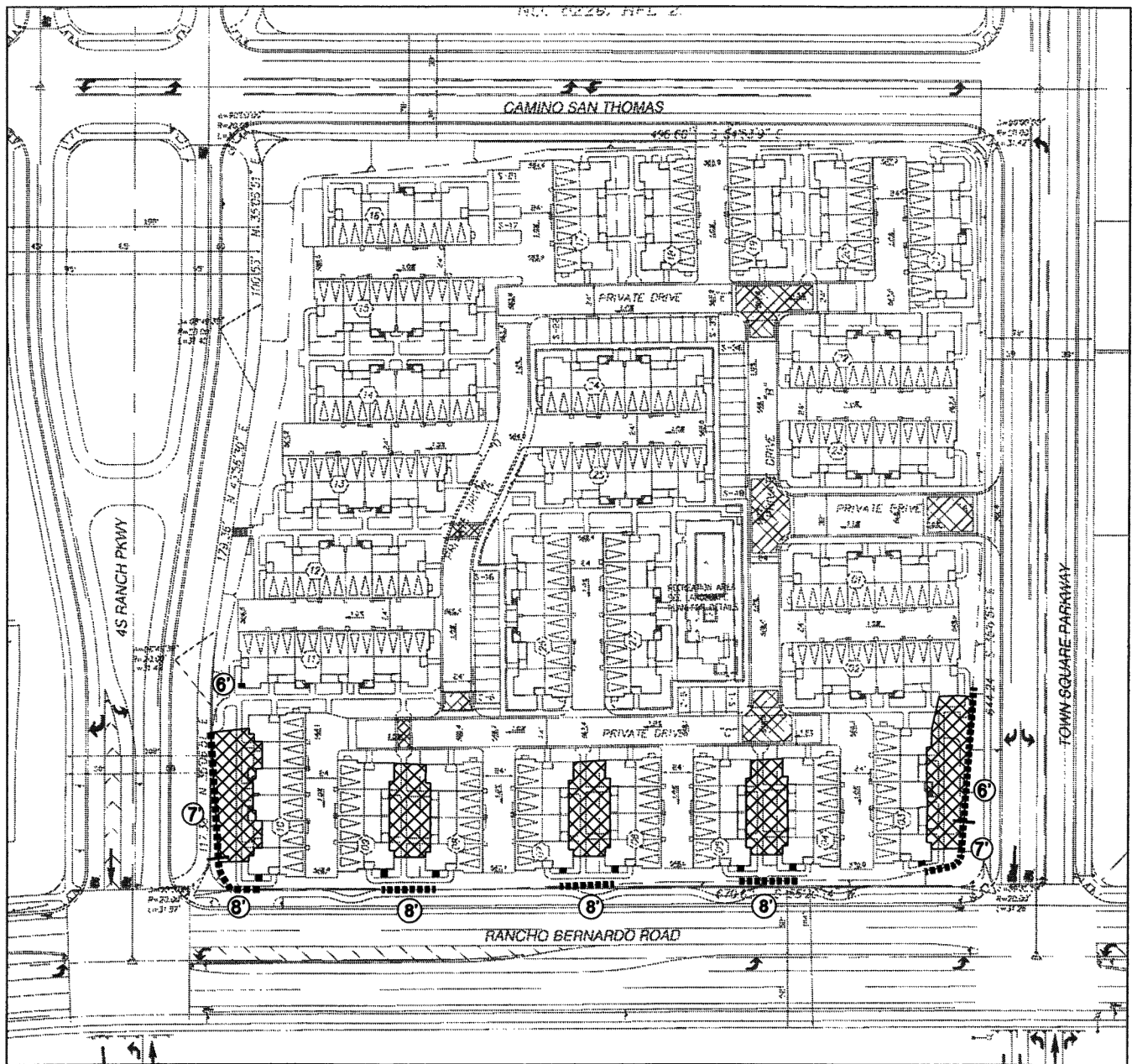


SOURCE: HUNSAKER & ASSOCIATES, FEBRUARY 2004

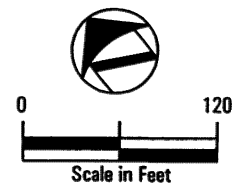


4S Ranch Planning Area 37 Project - Environmental Noise Assessment
Site Plan

FIGURE
3



Mitigated Noise Areas



SOURCE: HUNSAKER & ASSOCIATES, FEBRUARY 2004

4S Ranch Planning Area 37 Project - Environmental Noise Assessment Noise Barrier Heights and Locations

FIGURE
4

ATTACHMENT 1

Definitions

ATTACHMENT 1

DEFINITIONS

Term	Definition
<i>Ambient Noise Level</i>	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
<i>A-Weighted Sound Level (dBA)</i>	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
<i>Community Equivalent Sound Level (CNEL)</i>	CNEL is the A-weighted equivalent continuous sound exposure (CNEL) level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during the nighttime hours (10 p.m. to 7 a.m.) and 5 dB added to the sound during the evening hours (7 p.m. to 10 p.m.).
<i>Decibel (dB)</i>	A unit for measuring sound pressure level and is equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
<i>Time-Average Sound Level (TAV)</i>	The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. TAV is designed to average all of the loud and quiet sound levels occurring over a time period.

ATTACHMENT 2

Noise Level Calculation Data

Summary of Mitigated Areas

<u>Building</u>	<u>Unit Number</u>	<u>Mitigated Area</u>	<u>Mitigation</u>
3	All	Common Area Side of Building	6' to 8' barrier
4,5,6,7,8,9	All	Common Area Between Buildings	10' barrier
10	All	Common Area Side of Building	8' barrier
11	3 (west side)	Patio	6' Side barrier

4S Ranch PA 37--Future (4SPA37.mit)

T-Rancho Bernardo Road, 1

864 , 55 , 18 , 55 , 18 , 55

T-Rancho Bernardo Road, 2

864 , 55 , 18 , 55 , 18 , 55

T-4S Ranch Parkway, 3

238 , 30 , 2 , 30 , 2 , 30

T-4S Ranch Parkway, 4

238 , 30 , 2 , 30 , 2 , 30

T-Town Square Parkway, 5

123 , 30 , 1 , 30 , 1 , 30

T-Town Square Parkway, 6

123 , 30 , 1 , 30 , 1 , 30

L-Eastbound, 1

N,-502.,-88,563,E1

N,-198.,-39,565,E2

N,0.,-21,567,E3

N,192.,-21,567,E4

N,420.,-21,564,E5

N,675.,-21,563,E6

N,1180.,-21,563,E7

L-Westbound, 2

N,-511.,-47,563,W1

N,-200.,3,565,W2

N,0.,21,567,W3

N,192.,21,567,W4

N,420.,21,564,W5

N,675.,21,563,W6

N,1180.,21,563,W7

L-Northbound, 3

N,15.,0,567,N1

N,20.,190,566,N2

N,35.,332,560,N3

N,55.,476,554,N4

N,55.,643,550,N5

N,55.,770,550,N6

L-Southbound, 4

N,-20.,0,567,S1

N,-25.,190,566,S2

N,-45.,332,560,S3

N,-70.,476,554,S4

N,-70.,643,550,S5

N,-70.,770,550,S6

L-Southbound, 5

N,660.,0,563,TS1

N,660.,200,564,TS2

N,660.,330,566,TS3

N,660.,640,568,TS4

N,660.,770,568,TS5

L-Northbound, 6

N,690.,0,563,TN1

N,690.,200,564,TN2

N,690.,330,566,TN3

N,690.,640,568,TN4

N,690.,770,568,TN5

B-Building 3, 1 , 2 , 0 , 0

595.,170,570,595,B1

595.,71,570,595,B2

550.,71,570,595,B3

B-Building 4/5, 2 , 2 , 0 , 0

529.,150,570,580,B4
529.,68,570,580,B5
486.,69,570,580,B6
487.,69,570,570,
460.,67,568,568,
460.,67,568,578,
420.,67,568,578,
419.,150,568,578,
B-Building 6/7, 3 , 2 , 0 ,0
393.,150,568,578,
393.,65,568,578,B10
351.,68,568,578,B11
350.,68,568,568,
326.,66,567,567,
325.,66,567,577,
285.,66,567,577,
284.,148,567,577,
B-Building 8/9, 4 , 2 , 0 ,0
260.,147,567,577,
261.,67,567,577,B16
219.,67,567,577,B17
218.,67,567,567,
193.,65,568,568,
192.,65,568,578,
154.,65,568,578,
153.,147,568,578,
B-Building 11, 5 , 2 , 0 ,0
80.,245,567,577,
82.,205,567,577,
220.,205,567,577,
221.,245,567,577,
B-Building 10, 6 , 2 , 0 ,0
87.,185,568,593,
86.,65,568,593,
129.,64,568,593,
130.,185,568,593,
B-Slope, 7 , 2 , 0 ,0
75.,55,569,569,
305.,55,567,567,
408.,57,567,568,
520.,59,569,569,
560.,58,569,569,
615.,67,569,569,
B-Wall at BLDG. 3, 8 , 2 , 0 ,0
587.,63,570,578,
615.,67,570,578,
617.,86,570,578,
617.,87,570,576,
620.,170,570,576,
622.,205,569,575,
B-Wall at Bldg. 4/5, 9 , 2 , 0 ,0
452.,59,568,578,
494.,61,570,580,
B-Wall at Bldg. 6/7, 10 , 2 , 0 ,0
317.,58,567,577,
359.,60,568,578,
B-Wall at Bldg. 8/9, 11 , 2 , 0 ,0
184.,57,568,578,
227.,59,567,577,
B-Wall at Bldg. 10, 12 , 2 , 0 ,0

95.,57,568,576,
75.,59,568,576,
67.,79,568,576,
67.,80,568,576,
62.,150,568,576,
R, 1 , 67 ,500
420,205,573.,Rec Area
R, 2 , 67 ,500
340,62,574.,R2
R, 3 , 67 ,500
135,460,570.,R7/BDG15
R, 4 , 67 ,500
150,530,570.,R8/BDG16
R, 5 , 67 ,500
610,262,574.,BDG1
R, 6 , 67 ,500
610,195,574.,BDG2
R, 7 , 67 ,500
597,70,575.,BDG3
R, 8 , 67 ,500
85,63,573.,BDG10
R, 9 , 67 ,500
615,490,573.,BDG21
R, 10 , 67 ,500
610,425,572.,BDG22
R, 11 , 67 ,500
610,360,572.,BDG23
R, 12 , 67 ,500
338,80,573.,BDG6/7
R, 13 , 67 ,500
338,90,573.,BDG6/7
R, 14 , 67 ,500
338,100,573.,BDG6/7
R, 15 , 67 ,500
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R, 23 , 67 ,500
205,120,573.,Bldg 8/9
R, 24 , 67 ,500
605,80,575.,Bldg 3
R, 25 , 67 ,500
605,100,575.,Bldg 3
R, 26 , 67 ,500
605,120,575.,Bldg 3
R, 27 , 67 ,500
76,75,573.,Bldg 10
R, 28 , 67 ,500

76,85,573.,Bldg 10
R, 29 , 67 ,500
76,100,573.,Bldg 10
R, 30 , 67 ,500
76,120,573.,Bldg 10
R, 31 , 67 ,500
87,204,571.,Bldg 11
C,C

36	-	8.*	B8 P2	19.1	MASONRY
37	-	7.*	B8 P3	2.2	MASONRY
38	-	6.*	B8 P4	83.1	MASONRY
39	-	6.*	B8 P5	35.1	MASONRY
40	-	10.*	B9 P1	42.1	MASONRY
41	-	10.*	B10 P1	42.1	MASONRY
42	-	10.*	B11 P1	43.1	MASONRY
43	-	8.*	B12 P1	20.1	MASONRY
44	-	8.*	B12 P2	21.5	MASONRY
45	-	8.*	B12 P3	1.0	MASONRY
46	-	8.*	B12 P4	70.2	MASONRY

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ (CAL)
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1	Rec Area	67.	500.	56.7
2	R2	67.	500.	62.1
3	R7/BDG15	67.	500.	60.5
4	R8/BDG16	67.	500.	59.9
5	BDG1	67.	500.	63.1
6	BDG2	67.	500.	58.9
7	BDG3	67.	500.	65.5
8	BDG10	67.	500.	66.1
9	BDG21	67.	500.	61.0
10	BDG22	67.	500.	61.3
11	BDG23	67.	500.	62.0
12	BDG6/7	67.	500.	60.3
13	BDG6/7	67.	500.	60.2
14	BDG6/7	67.	500.	59.9
15	BDG4/5	67.	500.	59.7
16	BDG4/5	67.	500.	59.1
17	R-17	67.	500.	60.8
18	R-18	67.	500.	60.8
19	R-19	67.	500.	60.8
20	R-20	67.	500.	60.8
21	Bldg 8/9	67.	500.	60.3
22	Bldg 8/9	67.	500.	59.4
23	Bldg 8/9	67.	500.	58.5
24	Bldg 3	67.	500.	59.5
25	Bldg 3	67.	500.	59.6
26	Bldg 3	67.	500.	59.3
27	Bldg 10	67.	500.	60.4
28	Bldg 10	67.	500.	59.9
29	Bldg 10	67.	500.	59.3
30	Bldg 10	67.	500.	59.0
31	Bldg 11	67.	500.	62.8

BARRIER TYPE	COST
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BERM	0.
MASONRY	224546.
MASONRY/JERSEY	0.
CONCRETE	0.

4S Ranch PA 37--Future (4SPA37.FUT)
T-Rancho Bernardo Road, 1
864 , 55 , 18 , 55 , 18 , 55
T-Rancho Bernardo Road, 2
864 , 55 , 18 , 55 , 18 , 55
T-4S Ranch Parkway, 3
238 , 30 , 2 , 30 , 2 , 30
T-4S Ranch Parkway, 4
238 , 30 , 2 , 30 , 2 , 30
T-Town Square Parkway, 5
123 , 30 , 1 , 30 , 1 , 30
T-Town Square Parkway, 6
123 , 30 , 1 , 30 , 1 , 30
L-Eastbound, 1
N, -502., -88,563, E1
N, -198., -39,565, E2
N, 0., -21,567, E3
N, 192., -21,567, E4
N, 420., -21,564, E5
N, 675., -21,563, E6
N, 1180., -21,563, E7
L-Westbound, 2
N, -511., -47,563, W1
N, -200., 3,565, W2
N, 0., 21,567, W3
N, 192., 21,567, W4
N, 420., 21,564, W5
N, 675., 21,563, W6
N, 1180., 21,563, W7
L-Northbound, 3
N, 15., 0,567, N1
N, 20., 190,566, N2
N, 35., 332,560, N3
N, 55., 476,554, N4
N, 55., 643,550, N5
N, 55., 770,550, N6
L-Southbound, 4
N, -20., 0,567, S1
N, -25., 190,566, S2
N, -45., 332,560, S3
N, -70., 476,554, S4
N, -70., 643,550, S5
N, -70., 770,550, S6
L-Southbound, 5
N, 660., 0,563, TS1
N, 660., 200,564, TS2
N, 660., 330,566, TS3
N, 660., 640,568, TS4
N, 660., 770,568, TS5
L-Northbound, 6
N, 690., 0,563, TN1
N, 690., 200,564, TN2
N, 690., 330,566, TN3
N, 690., 640,568, TN4
N, 690., 770,568, TN5
B-Building 3, 1 , 2 , 0 , 0
595., 170,571,581, B1
595., 71,571,581, B2
550., 71,571,581, B3
B-Building 4, 2 , 2 , 0 , 0

529.,150,571,581,B4
529.,68,571,581,B5
486.,68,571,581,B6
B-Building 5, 3 , 2 , 0 ,0
460.,148,569,579,B7
460.,67,569,579,B8
420.,67,569,579,B9
B-Building 6, 4 , 2 , 0 ,0
396.,68,569,579,B10
351.,68,569,579,B11
351.,150,569,579,B12
B-Building 7, 5 , 2 , 0 ,0
326.,66,568,578,B13
286.,66,568,578,B14
286.,149,568,578,B15
B-Building 8, 6 , 2 , 0 ,0
261.,67,568,578,B16
221.,67,568,578,B17
221.,147,568,578,B18
B-Building 11, 7 , 2 , 0 ,0
80.,245,567,577,
82.,205,567,577,
220.,205,567,577,
221.,245,567,577,
B-Building 10, 8 , 2 , 0 ,0
87.,185,570,580,
86.,65,570,580,
129.,64,570,580,
130.,185,570,580,
R, 1 , 67 ,500
420,205,573.,Rec Area
R, 2 , 67 ,500
340,62,574.,R2
R, 3 , 67 ,500
80,205,572.,R3/BDG11
R, 4 , 67 ,500
98,270,572.,R4/BDG12
R, 5 , 67 ,500
113,335,571.,R5/BDG13
R, 6 , 67 ,500
132,400,571.,R6/BDG14
R, 7 , 67 ,500
135,460,571.,R7/BDG15
R, 8 , 67 ,500
150,530,571.,R8/BDG16
R, 9 , 67 ,500
610,262,575.,BDG1
R, 10 , 67 ,500
610,195,575.,BDG2
R, 11 , 67 ,500
597,70,575.,BDG3
R, 12 , 67 ,500
85,63,575.,BDG10
R, 13 , 67 ,500
615,490,573.,BDG21
R, 14 , 67 ,500
610,425,573.,BDG22
R, 15 , 67 ,500
610,360,573.,BDG23
C,C

11	-	10.*	B16	40.0	MASONRY
12	-	10.*	B17	80.0	MASONRY
13	-	10.*	B7 P1	40.0	MASONRY
14	-	10.*	B7 P2	138.0	MASONRY
15	-	10.*	B7 P3	40.0	MASONRY
16	-	10.*	B8 P1	120.0	MASONRY
17	-	10.*	B8 P2	43.0	MASONRY
18	-	10.*	B8 P3	121.0	MASONRY

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ (CAL)
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1	Rec Area	67.	500.	58.7
2	R2	67.	500.	73.2
3	R3/BDG11	67.	500.	65.1
4	R4/BDG12	67.	500.	61.7
5	R5/BDG13	67.	500.	61.8
6	R6/BDG14	67.	500.	61.2
7	R7/BDG15	67.	500.	61.0
8	R8/BDG16	67.	500.	60.4
9	BDG1	67.	500.	64.1
10	BDG2	67.	500.	65.3
11	BDG3	67.	500.	72.5
12	BDG10	67.	500.	73.2
13	BDG21	67.	500.	61.5
14	BDG22	67.	500.	62.0
15	BDG23	67.	500.	62.7

BARRIER TYPE	COST
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BERM	0.
MASONRY	109801.
MASONRY/JERSEY	0.
CONCRETE	0.

TOTAL COST = \$ 110000.

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.

11	-	10.*	B16	40.0	MASONRY
12	-	10.*	B17	80.0	MASONRY
13	-	10.*	B7 P1	40.0	MASONRY
14	-	10.*	B7 P2	138.0	MASONRY
15	-	10.*	B7 P3	40.0	MASONRY
16	-	10.*	B8 P1	120.0	MASONRY
17	-	10.*	B8 P2	43.0	MASONRY
18	-	10.*	B8 P3	121.0	MASONRY

1 0 1 2 3 4 5 6 7

2nd Floor

REC REC ID DNL PEOPLE LEQ (CAL)

1	Rec Area	67.	500.	60.2
2	R2	67.	500.	72.9
3	R3/BDG11	67.	500.	65.3
4	R4/BDG12	67.	500.	63.1
5	R5/BDG13	67.	500.	62.1
6	R6/BDG14	67.	500.	61.4
7	R7/BDG15	67.	500.	61.1
8	R8/BDG16	67.	500.	60.5
9	BDG1	67.	500.	64.2
10	BDG2	67.	500.	65.5
11	BDG3	67.	500.	72.3
12	BDG10	67.	500.	72.9
13	BDG21	67.	500.	61.5
14	BDG22	67.	500.	62.0
15	BDG23	67.	500.	62.7

BARRIER TYPE COST

BERM	0.
MASONRY	109801.
MASONRY/JERSEY	0.
CONCRETE	0.

TOTAL COST = \$ 110000.

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
 CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.

11	-	10.*	B16	40.0	MASONRY
12	-	10.*	B17	80.0	MASONRY
13	-	10.*	B7 P1	40.0	MASONRY
14	-	10.*	B7 P2	138.0	MASONRY
15	-	10.*	B7 P3	40.0	MASONRY
16	-	10.*	B8 P1	120.0	MASONRY
17	-	10.*	B8 P2	43.0	MASONRY
18	-	10.*	B8 P3	121.0	MASONRY

0 1 2 3 4 5 6 7

1
REC REC ID DNL PEOPLE LEQ(CAL)

1	Rec Area	67.	500.	61.5
2	R2	67.	500.	72.5
3	R3/BDG11	67.	500.	65.7
4	R4/BDG12	67.	500.	64.1
5	R5/BDG13	67.	500.	62.8
6	R6/BDG14	67.	500.	61.6
7	R7/BDG15	67.	500.	61.2
8	R8/BDG16	67.	500.	60.5
9	BDG1	67.	500.	64.3
10	BDG2	67.	500.	65.8
11	BDG3	67.	500.	72.0
12	BDG10	67.	500.	72.6
13	BDG21	67.	500.	61.5
14	BDG22	67.	500.	62.0
15	BDG23	67.	500.	62.8

BARRIER TYPE COST

BERM	0.
MASONRY	109801.
MASONRY/JERSEY	0.
CONCRETE	0.

TOTAL COST = \$ 110000.

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.10.

3rd Floor

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 9; Unit 2; Bedroom 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	70	68	67	66	64	64	64	66	65	63	60	60	59	57	56	54	50	48

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 31	8	32	22	23	25	25	25	26	26	27	28	29	33	33	35	34	32	32	31
Stucco Siding w/o channels STC 46	50	72	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	24	28	30	30	31	31	32	33	34	38	38	40	39	37	37	36

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	32	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	451	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	124	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			156	154	137	94	77	73	75	72	83	89	120	122	117	119	120	128	140

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	53	53	55	57	61	62	61	59	60	60	58	57	55	51	49
Interior A-Weighted Sound Level		29	31	30	30	33	34	38	37	35	32	28	27	24	24	24	19	18
Exterior CNEL	70																	
Interior CNEL	44																	

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 9; Unit 2; Master Bedroom; Wall 1

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	73	71	70	69	67	67	67	69	68	66	63	63	62	60	59	57	53	51

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 34	11	32	22	23	28	28	28	29	29	30	31	32	36	36	38	37	35	35	35
Stucco Siding w/o channels STC 46	50	72	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	24	29	33	33	34	34	35	36	37	40	40	42	42	40	40	40

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	64	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	535	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	176	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			197	195	174	123	103	100	103	100	116	124	168	170	162	163	164	174	190

[illegible]

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 9; Unit 2; Master Bedroom; Wall 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	70	68	67	66	64	64	64	66	65	63	60	60	59	57	56	54	50	48

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 34	11	32	22	23	28	28	29	29	30	31	32	36	36	38	37	35	35	35	
Stucco Siding w/o channels STC 46	50	76	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	55	
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	24	29	33	33	34	34	35	36	37	40	40	42	42	40	40	

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	64	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	535	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	176	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			197	195	174	123	103	100	103	100	116	124	168	170	162	163	164	174	190

Sound Levels	Sound Pressure Level (dB re 20 µPa)																
	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level	49	51	53	53	55	57	61	62	61	59	60	60	58	57	55	51	49
Interior A-Weighted Sound Level	28	30	27	26	29	30	34	33	31	28	24	23	20	20	20	15	12
Exterior CNEL	70																
Interior CNEL	40																

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 8; Unit 3; Master Bedroom; Wall 1

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	73	71	70	69	67	67	67	69	68	66	63	63	62	60	59	57	53	51

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 33	10	32	22	23	27	27	27	28	28	29	30	31	35	35	37	36	34	34	33
Stucco Siding w/o channels STC 46	50	76	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	24	29	32	32	33	33	34	35	36	39	40	42	41	39	39	38

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	41	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	574	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	182	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			201	199	178	124	102	100	103	100	117	126	172	175	167	169	170	181	197

Sound Levels		Sound Pressure Level (dB re 20 μPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		52	54	56	56	58	60	64	65	64	62	63	63	61	60	58	54	52
Interior A-Weighted Sound Level		31	33	31	30	33	34	37	37	35	32	28	27	24	23	23	19	17
Exterior CNEL	73																	
Interior CNEL	44																	

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 8; Unit 3; Master Bedroom; Wall 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	70	68	67	66	64	64	64	66	65	63	60	60	59	57	56	54	50	48

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 33	10	9	22	23	27	27	27	28	28	29	30	31	35	35	37	36	34	34	33
Stucco Siding w/o channels STC 46	50	99	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			25	25	30	36	36	38	37	39	39	40	43	43	45	45	44	44	44

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	41	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	574	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	182	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			201	199	178	124	102	100	103	100	117	126	172	175	167	169	170	181	197

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	53	53	55	57	61	62	61	59	60	60	58	57	55	51	49
Interior A-Weighted Sound Level		28	29	27	22	25	26	30	29	27	24	21	20	17	16	16	11	9
Exterior CNEL	70																	
Interior CNEL	38																	

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 8; Unit 3; Bedroom 2; Wall 1

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	73	71	70	69	67	67	67	69	68	66	63	63	62	60	59	57	53	51

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 33	10	5	22	23	27	27	27	28	28	29	30	31	35	35	37	36	34	34	33
Stucco Siding w/o channels STC 46	50	71	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			25	25	30	37	37	38	38	39	40	41	43	44	46	46	44	44	44

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	21	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	463	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	124	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			156	154	137	93	75	72	74	70	82	88	119	122	117	119	120	129	140

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		52	54	56	56	58	60	64	65	64	62	63	63	61	60	58	54	52
Interior A-Weighted Sound Level		30	32	29	24	28	28	32	32	30	26	24	23	20	18	18	13	11
Exterior CNEL	73																	
Interior CNEL	40																	

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 8; Unit 3; Bedroom 2; Wall 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Rancho Bernardo Road	120	70	68	67	66	64	64	64	66	65	63	60	60	59	57	56	54	50	48

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 33	10	16	22	23	27	27	27	28	28	29	30	31	35	35	37	36	34	34	33
Stucco Siding w/o channels STC 46	50	88	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	25	29	34	34	36	35	37	37	38	41	42	44	43	42	42	41

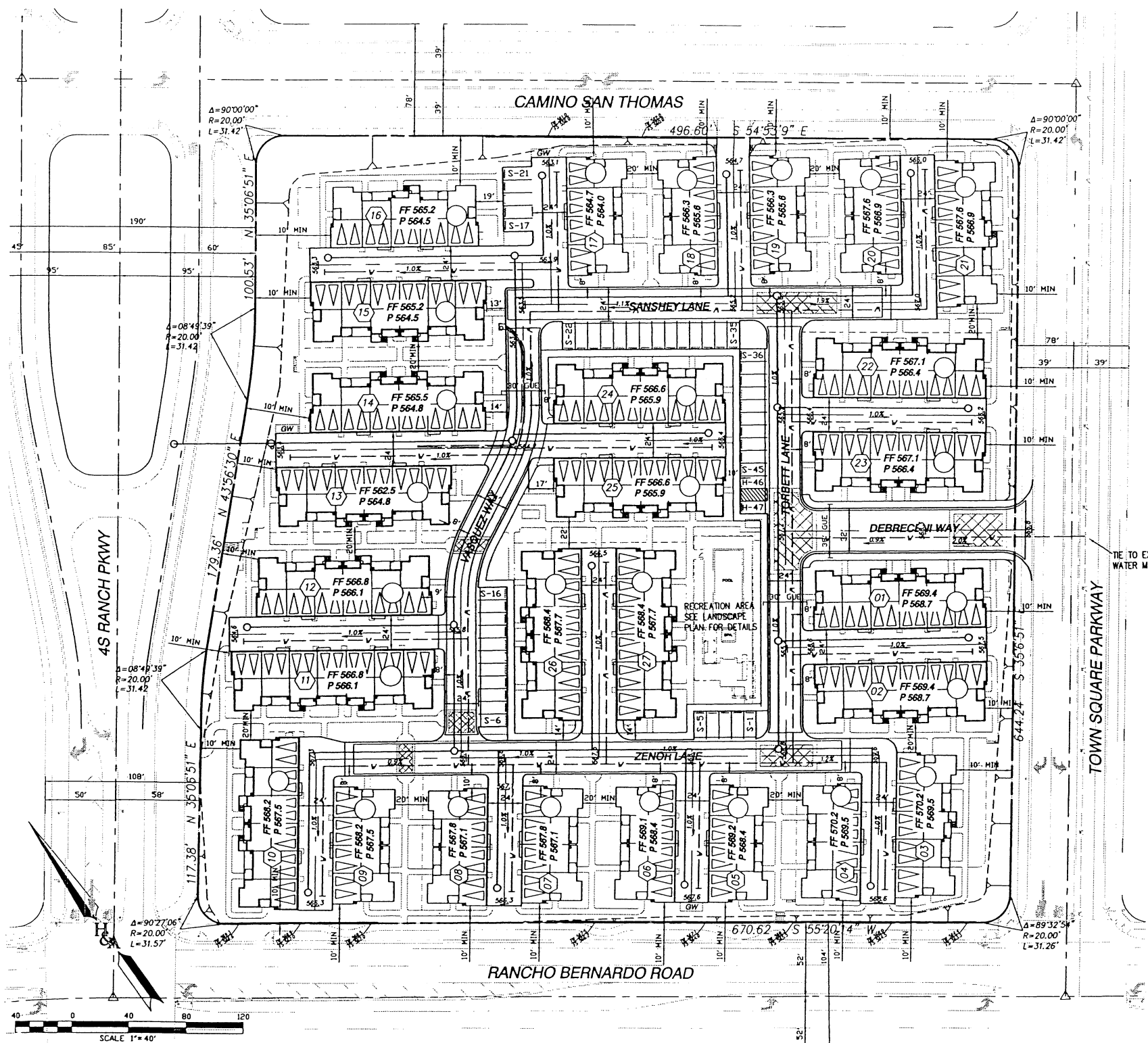
Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	21	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	463	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	124	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.75
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			156	154	137	93	75	72	74	70	82	88	119	122	117	119	120	129	140

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	53	53	55	57	61	62	61	59	60	60	58	57	55	51	49
Interior A-Weighted Sound Level		29	31	28	25	29	29	33	33	31	27	24	23	20	19	19	15	13
Exterior CNEL	70																	
Interior CNEL	40																	

ATTACHMENT 3

Typical Condensing Unit Locations
and
Related Noise Level Calculations

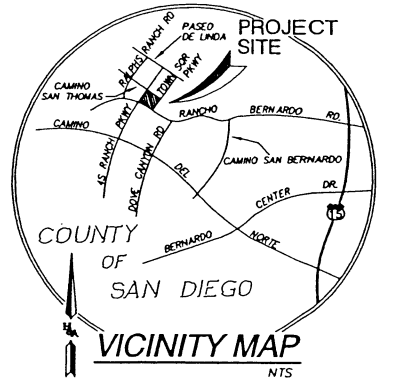
A/C EXHIBIT
4S RANCH PA 37



LEGEND

SUBDIVISION BOUNDARY
LOT LINE
PROPOSED BLDG NUMBER
PAD ELEV / FINISHED FLOOR
EASEMENT LINE
SLOPE (2:1 MAX)
RETAINING WALL
EXISTING SPOT ELEVATIONS
PROPOSED SPOT ELEVATION
EXISTING CONTOURS
PROPOSED CONTOURS
PROPOSED A/C UNIT

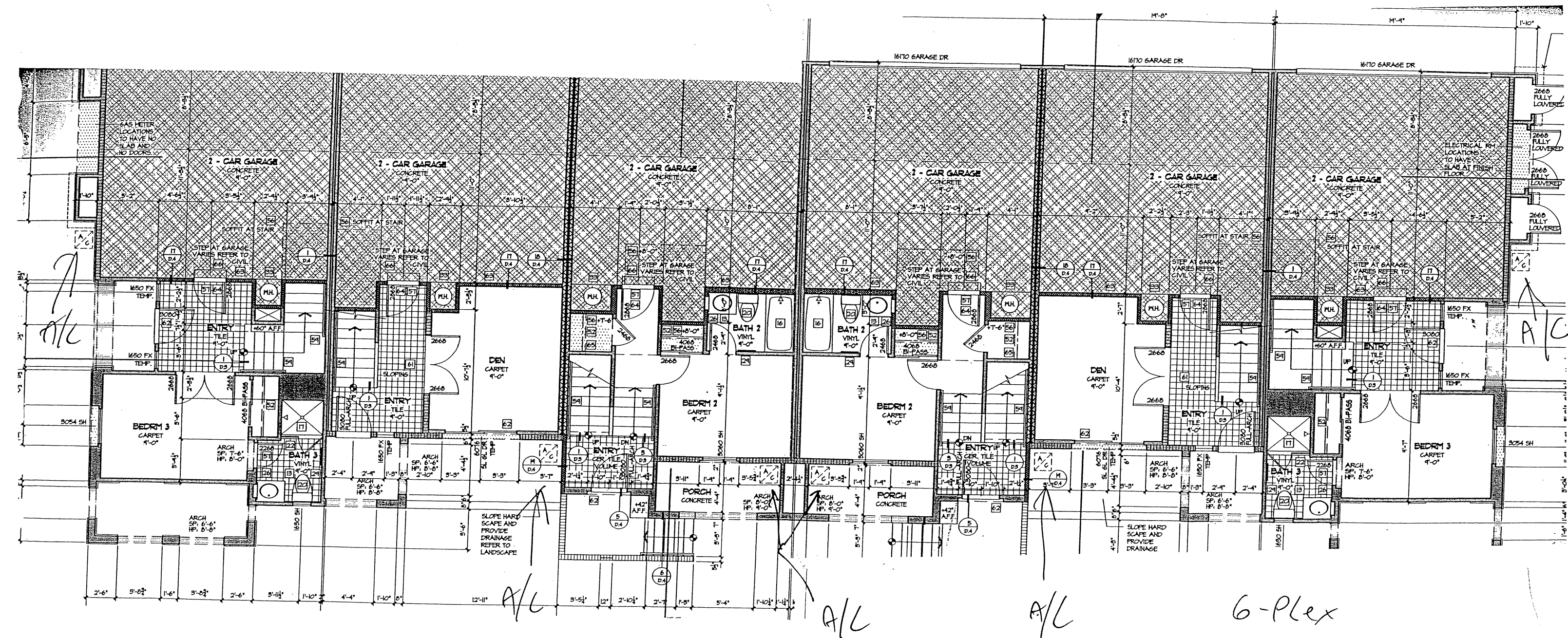
29
FF 547.3
P 546.6
(255.5)
237.7
650
DENOTES

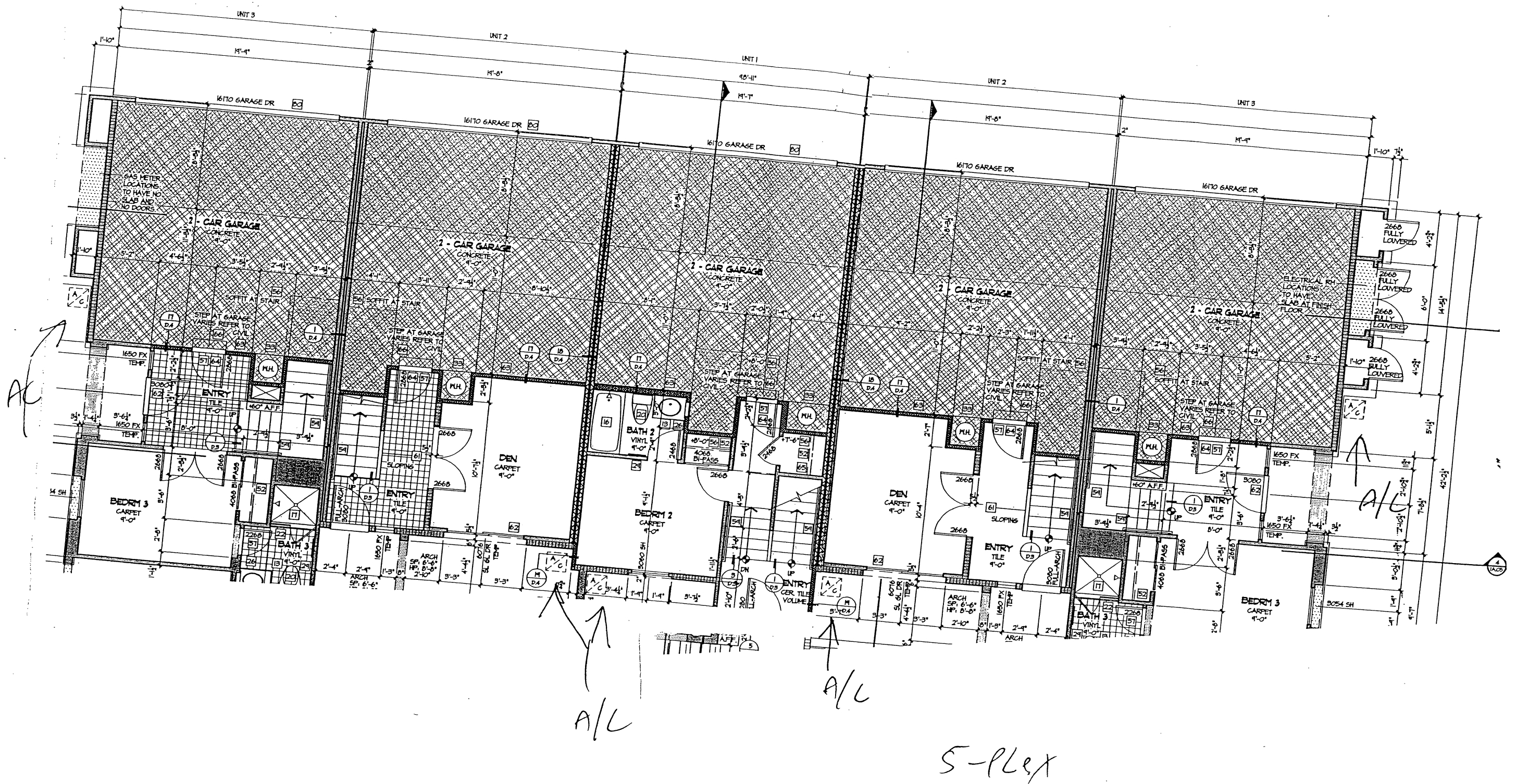


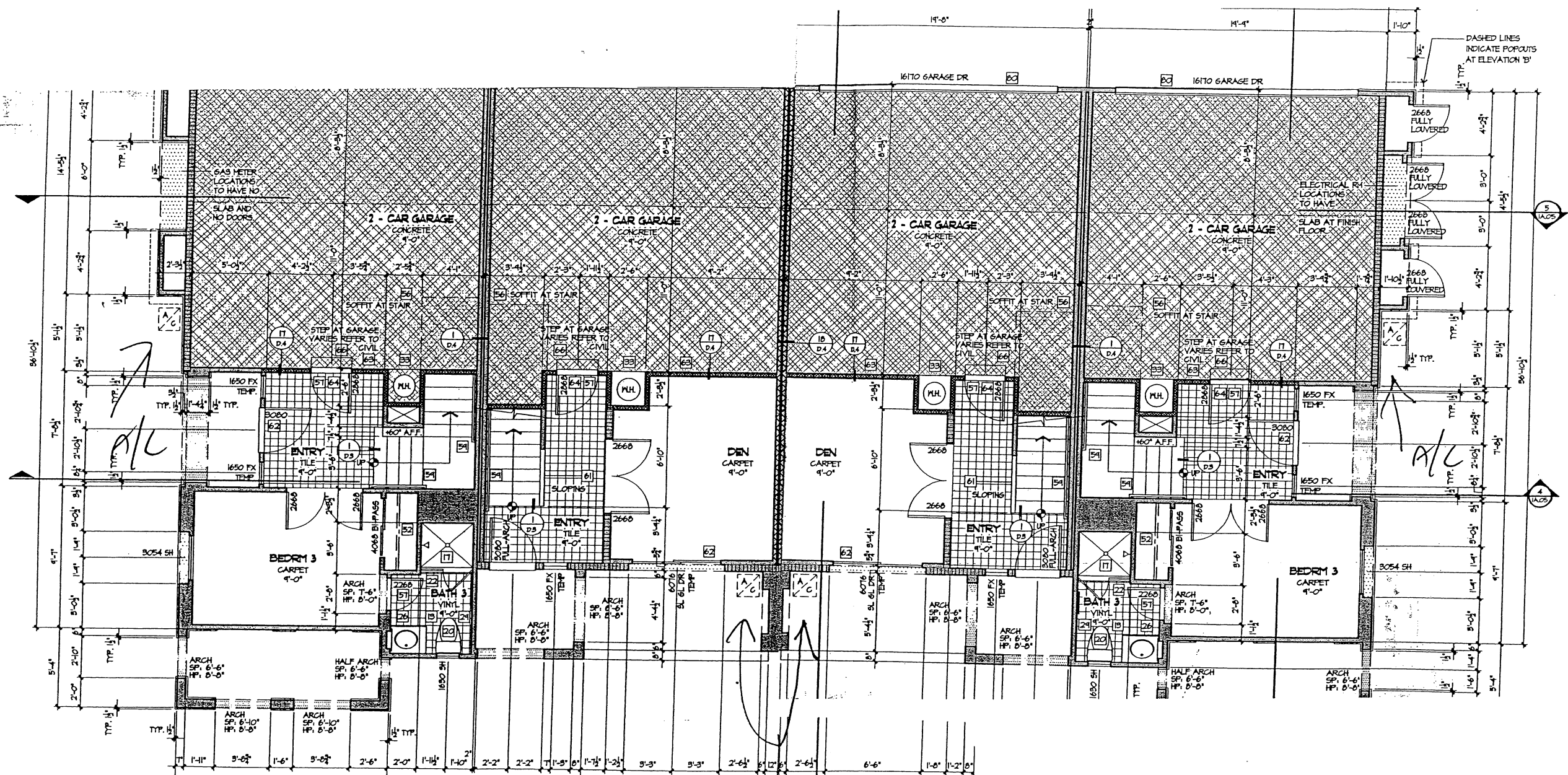
PREPARED BY:	NO.	REVISIONS	DATE	BY
 HUNSAKER & ASSOCIATES SAN DIEGO, INC. <small>PLANNING 1079 Hunsakers Street ENGINEERING San Diego, CA 92101 SURVEYING PH: 619-595-4500 FAX: 619-595-5414</small>	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			

A/C EXHIBIT
4 S RANCH - PA 37
(LOT 263 OF 4S RANCH COUNTY TRACT NO. 5229 RPL2)
COUNTY OF SAN DIEGO, CALIFORNIA

SHEET
1
OF
1



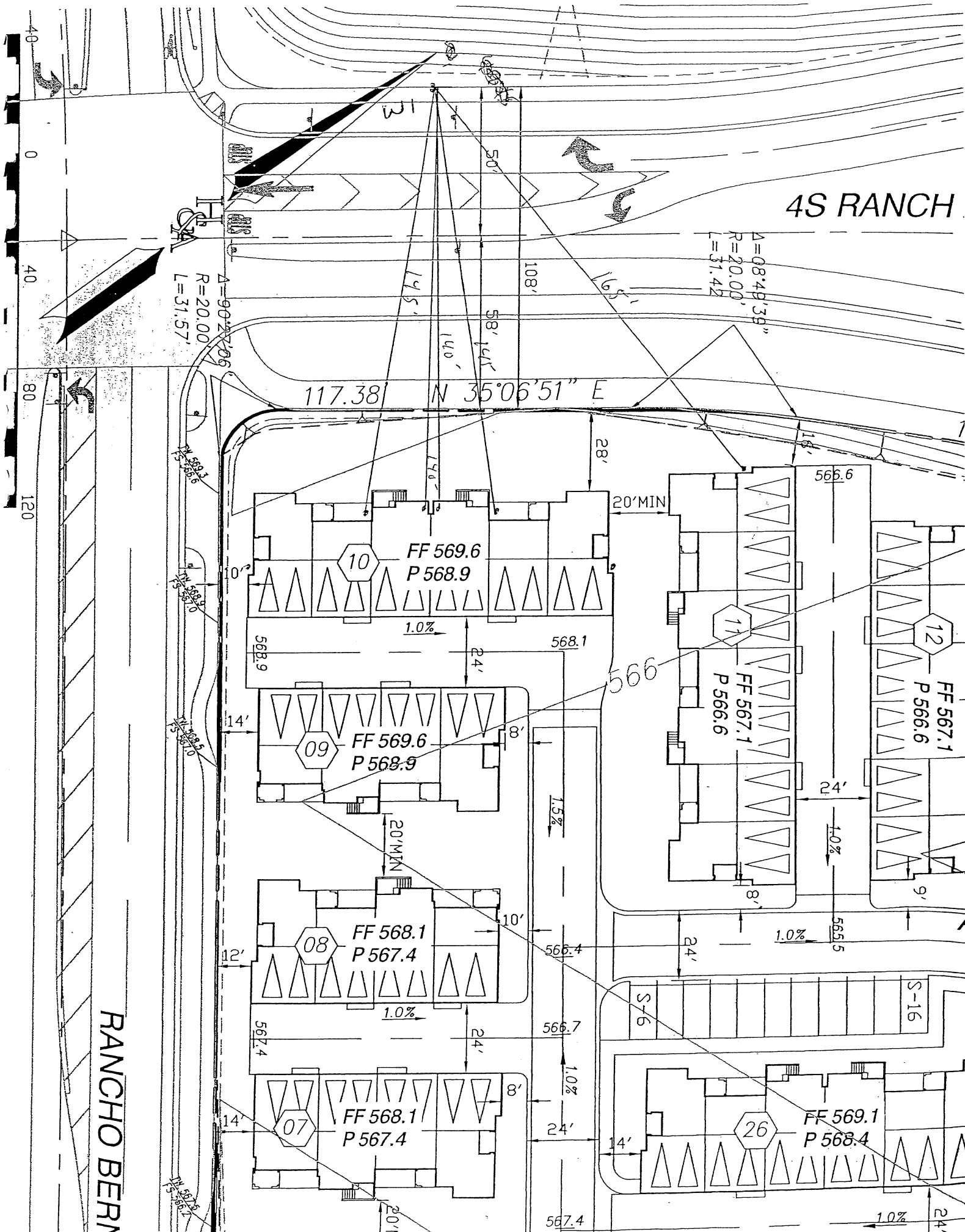




A/C

Y-Plex

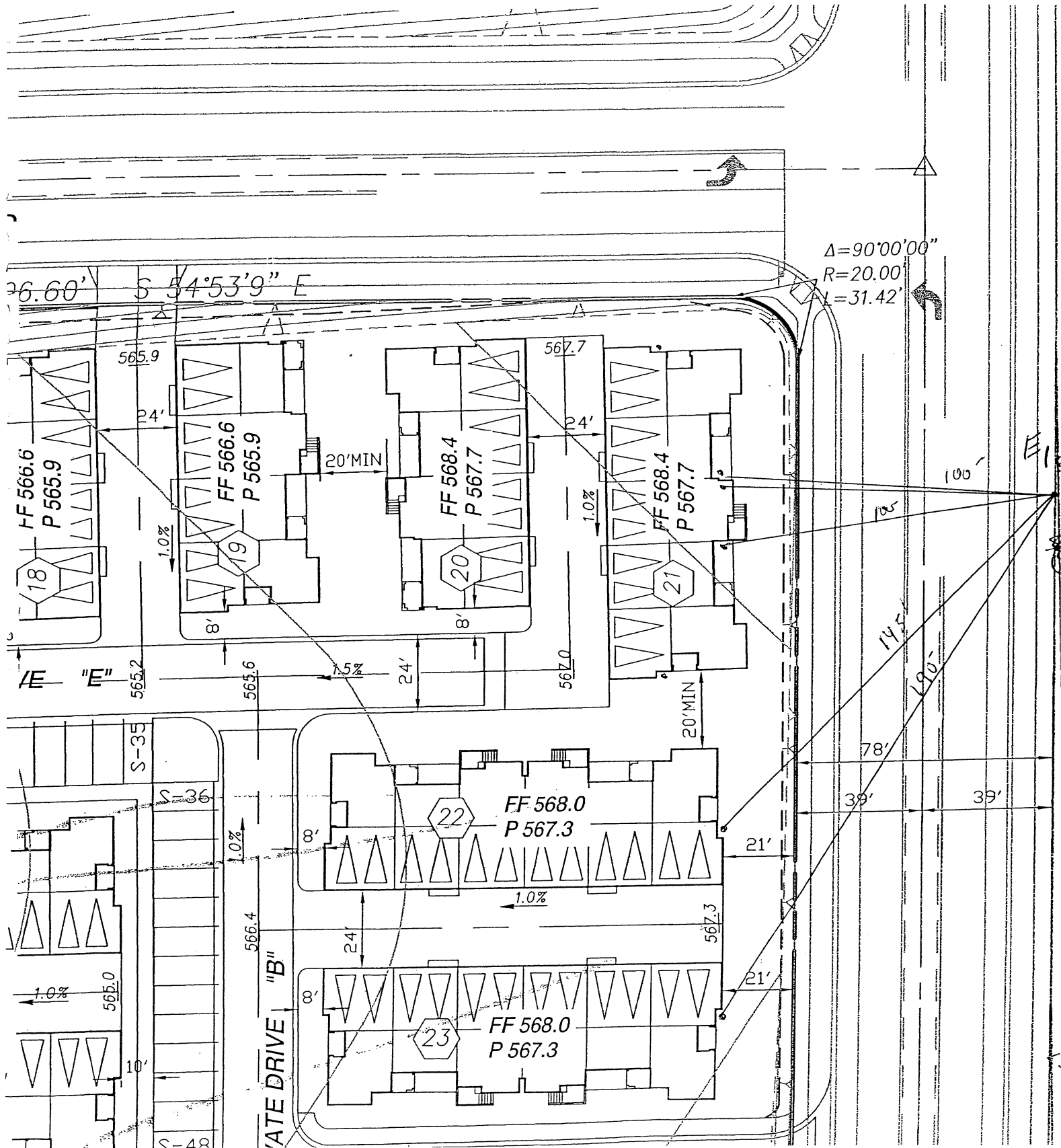
1150-71 42



PA 37

Criteria
= 50 dB

O. 5229 RPL2 LOT 263)



Condensing Unit	Lwa	Distance	Lp (no barrier)	Minimum Barrier Attenuation	Lp	Distance	Lp (no barrier)	Minimum Barrier Attenuation	Lp
c1	80	100	42.3	-5	37.3	165	38.0	0	38.0
c2	80	100	42.3	-5	37.3	145	39.1	-5	34.1
c3	80	105	41.9	-5	36.9	140	39.4	-5	34.4
c4	80	145	39.1	0	39.1	140	39.4	-5	34.4
c5	80	190	36.7	0	36.7	145	39.1	-5	34.1
Reflection		3		East	45			West	42
					48				45
Plan 1 and 2		80	Lwa						
Plan 3		78	Lwa						

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 10; Unit 2; Den

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Traffic and AC	127	66	68	67	64	63	61	60	59	59	57	56	55	55	54	54	53	51	50

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 32	9	45	22	23	26	26	26	27	27	28	29	30	34	34	36	35	33	33	32
Stucco Siding w/o channels STC 46	50	54	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			23	24	28	29	29	30	30	31	32	33	37	37	39	38	36	36	35

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	45	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	515	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	138	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			181	179	159	109	89	85	86	82	95	102	135	138	131	134	135	144	157

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	51	52	52	53	54	56	55	55	55	56	55	55	54	52	51
Interior A-Weighted Sound Level		29	30	27	28	30	30	30	31	29	28	23	23	21	22	23	20	20
Exterior CNEL	66																	
Interior CNEL	40																	

$$\text{Mitigated Traffic} = 60 \text{ dB CNEL}$$

$$A/C = 72 @ 3' \quad 10 \log \left(\frac{15 \times 10^{-7.2}}{24} \right) = 65 \text{ CNEL}$$

$$\text{Combined} = 66 \text{ CNEL}$$

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Building 10; Unit 1; Bedroom 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 μPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Traffic and AC	127	66	68	67	64	63	61	60	59	59	57	56	55	55	54	54	53	51	50

Element		Code	Area	Transmission Loss (dB)																
				100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Sliding Window Dual Glaze STC 30		7	18	22	23	24	24	24	25	25	26	27	28	32	32	34	33	31	31	30
Stucco Siding w/o channels STC 46		50	86	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
		0	0																	
		0	0																	
		0	0																	
Composite TL				24	25	28	31	31	32	32	33	34	35	39	39	41	40	38	38	38

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	18	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	454	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	104	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			151	148	131	88	70	66	67	62	72	77	102	106	101	105	106	113	124

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	51	52	52	53	54	56	55	55	55	56	55	55	54	52	51
Interior A-Weighted Sound Level		29	31	27	28	29	29	30	31	28	27	22	23	20	21	22	19	19
Exterior CNEL	66																	
Interior CNEL	39																	

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Unit 1; Bedroom 2

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Traffic and AC	127	66	68	67	64	63	61	60	59	59	57	56	55	55	54	54	53	51	50

Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Generic dual-glazed sliding window STC 26	4	18	21	23	21	22	22	20	18	22	26	28	31	33	34	35	36	36	31
Stucco Siding w/o channels STC 46	50	86	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			24	25	27	29	29	28	26	30	33	35	38	40	41	42	43	43	39

Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	18	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	454	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	104	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			151	148	131	88	70	66	67	62	72	77	102	106	101	105	106	113	124

Sound Levels		Sound Pressure Level (dB re 20 μPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	51	52	52	53	54	56	55	55	55	56	55	55	54	52	51
Interior A-Weighted Sound Level		29	31	29	29	31	34	37	35	29	27	23	22	20	19	17	15	18
Exterior CNEL		66																
Interior CNEL		42																

EXTERIOR TO INTERIOR NOISE LEVEL CALCULATION

ROOM: Unit 2; Den

Noise Source	Code	Exterior Sound Pressure Level (dB re 20 µPa)																	
		CNEL	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Traffic and AC	127	66	68	67	64	63	61	60	59	59	57	56	55	55	54	54	53	51	50

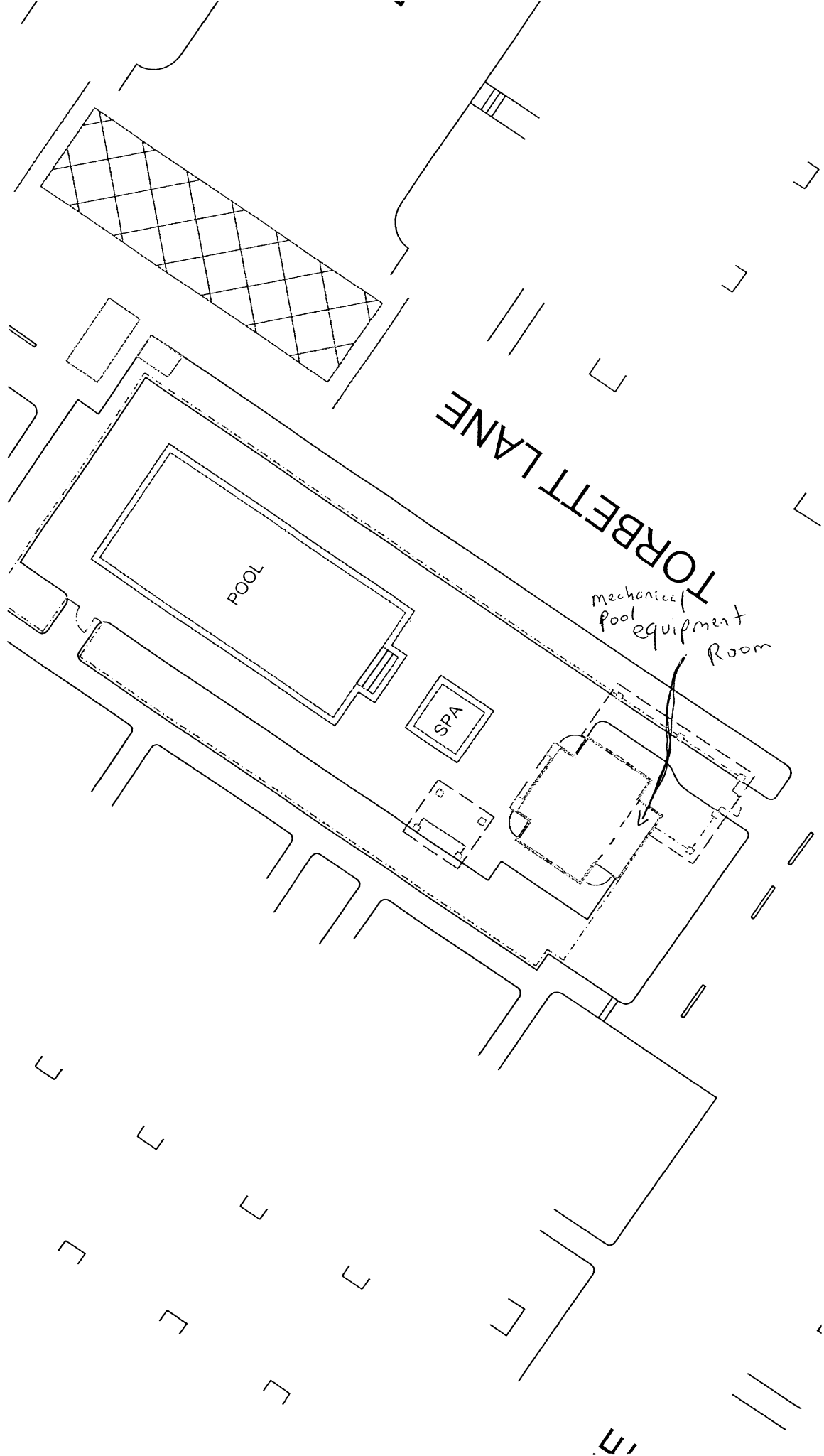
Element	Code	Area	Transmission Loss (dB)																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Generic dual-glazed sliding window STC 26	4	45	21	23	21	22	22	20	18	22	26	28	31	33	34	35	36	36	31
Stucco Siding w/o channels STC 46	50	54	25	25	30	42	41	44	43	45	45	46	45	46	48	50	50	50	55
	0	0																	
	0	0																	
	0	0																	
Composite TL			23	24	24	25	25	23	21	25	29	31	34	36	37	38	39	39	34

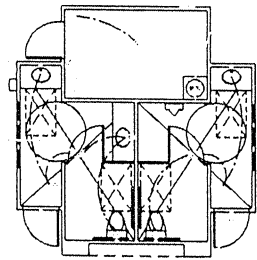
Surface	Code	Area	Absorption Coefficients																
			100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Glass	80	45	0.35	0.35	0.30	0.25	0.25	0.20	0.20	0.18	0.15	0.15	0.12	0.10	0.08	0.07	0.06	0.05	0.04
Gypsum board	81	515	0.30	0.29	0.25	0.15	0.10	0.08	0.07	0.05	0.05	0.05	0.04	0.05	0.05	0.07	0.07	0.08	0.09
Carpet on pad	100	138	0.08	0.10	0.12	0.15	0.19	0.25	0.30	0.35	0.45	0.50	0.79	0.78	0.74	0.69	0.70	0.73	0.79
	0	0																	
	0	0																	
	0	0																	
Total Room Absorption			181	179	159	109	89	85	86	82	95	102	135	138	131	134	135	144	157

Sound Levels		Sound Pressure Level (dB re 20 µPa)																
		100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
Exterior A-Weighted Sound Level		49	51	51	52	52	53	54	56	55	55	55	56	55	55	54	52	51
Interior A-Weighted Sound Level		30	30	31	32	34	37	39	37	32	30	25	24	23	22	20	17	21
Exterior CNEL	66																	
Interior CNEL	45																	

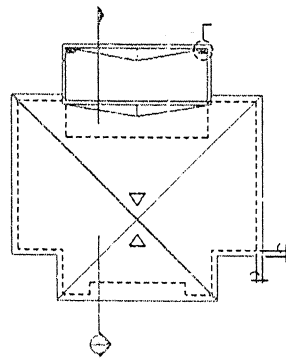
ATTACHMENT 4

Pool/Spa Pump Equipment Location

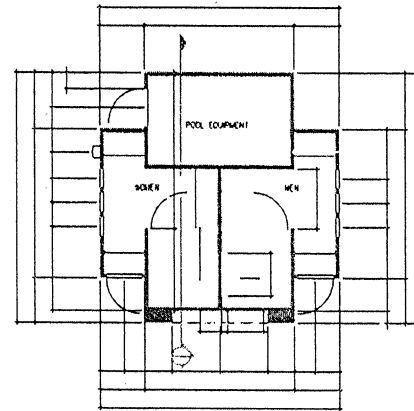




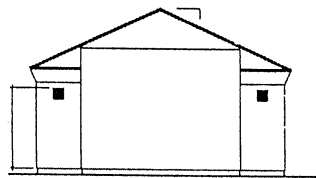
ELECT./MECH. PLAN



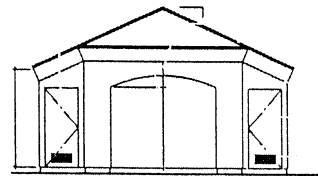
ROOF PLAN



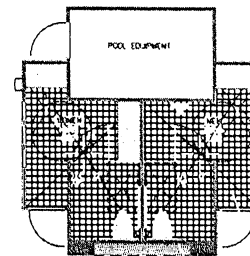
DIMENSIONED PLAN



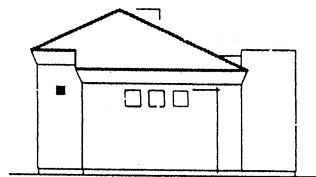
REAR ELEVATION



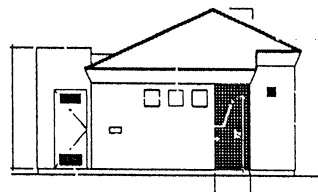
FRONT ELEVATION



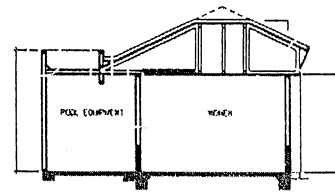
FIRST FLOOR PLAN



RIGHT SIDE ELEVATION



LEFT SIDE ELEVATION



SECTION 'A'



LEGEND

ATTACHMENT 5

Attic Vent Baffle Treatment

Attachment 8

Example of Attic Vent Baffle Treatment

